Alps; (b) that which occurred during the glacial period; (c) that which is the work of the modern epoch.

Four years ago M. G. Rolland announced his belief that the great fresh-water formations of the Sahara are much less recent than had been hitherto believed, the greater portion of them belonging to the pliocene instead of the quaternary age. Subsequent studies of these deposits have confirmed his first opinion, of which he has now found palæontological proof by the discovery of a number of casts of species of Helix belonging to the group of *H. tissoti* and *semperina*, which characterize the lower pliocene of Biskra and Constantine. M. Rolland also shows the synchronism which exists between the different beds of the Eastern Sahara and the corresponding fresh-water beds of the pliocene and quaternary formations in the Atlas region.

MINERALOGY AND PETROGRAPHY.[1]

PETROGRAPHICAL NEWS.—Among the rocks gathered by Reyer[2] during a journey through the Sierra Nevada Mountains, Schuster[3] has found the following principal types: biotite granites, containing microcline and pilitized biotite; saussurite-diorite and quartz-diorite, containing orthoclase; saussurite, pilite, and biotite gabbros; quartz-porphyrites, kersantites, andesites, serpentine, fragmental rocks, and tufas. Although the paper in which these rocks are described consists merely of detailed descriptions of detached rock-specimens, it nevertheless contains many points of considerable interest. Pyrophyllite is mentioned as an alteration product of olivine and of plagioclase; reaction rims around augite and olivine are pictured; intergrowths of biotite and augite, of biotite and hornblende, and the alteration of biotite into pilite and into hornblende, are each described. Chromium mica is mentioned as occurring in a magnesite concretion in serpentine; helminth, as a constituent of a diabase porphyrite, and anorthoclase, as existing in a hornblende porphyrite. A most interesting case of intergrowth is that in which a long, tabular crystal of plagioclase penetrates diallage in such a way that its long edges are parallel to the orthopinacoid of the augite, and its twining lamellæ are parallel to the lines of inclusions in this mineral. Indications of the effects of pressure were seen in a large number of the sections examined.——Dr. Wadsworth[4] has recently published a report embracing preliminary descriptions of the peridotites, gabbros, diabases, and other rocks of

[1] Edited by Dr. W. S. Bayley, Colby University, Waterville, Me.
[2] Neues Jahrb. f. Minn., etc. Beil. Bd. v., p. 451.
[3] Ib., Beil. Bd. iv., p. 291.
[4] Geolog. and Nat. Hist. Survey of Minnesota, Bulletin No. 2. Minneapolis, 1887.

Minnesota. The report opens with a restatement of the author's views in regard to the classification of massive rocks[1] and a plea for the more careful discussion of the altered forms of rocks, with reference to the original forms from which they have been derived. The rocks described in this bulletin are typical specimens which have been collected from all over the northern portion of Minnesota by various members of the State Survey during the past few years. They are, therefore, not studied in their field relations to one another. The gabbros and diabases are the most widespread, and are regarded as very closely connected. Among the altered forms of gabbro are placed Irving's orthoclase gabbros[2] and most of his augite syenites, though some of the latter may possibly be altered forms of more acid rocks. Biotite as a secondary product, due to the reaction between magnetite and feldspar, and the same mineral, occurring as an alteration product of pyroxene, are described and figured. Norites, serpentines, hornblende-porphyrites, and many diabases are also briefly described. Lack of time and the impossibility of studying some of the most interesting of the rocks in their field relations prevented Dr. Wadsworth from elaborating many of the points which he has been able merely to indicate in his report.

The rocks comprising the three mountains in the Rhone region —known as Linsberg, Ulmenstein, and Pietzelstein—have been carefully investigated by Möller.[3] This author finds Linsberg to consist principally of a porphyritic rock composed of sanidine, andesine, augite, and nepheline, together with a few other minerals in small quantity. In the rock from near the top of the mountain the plagioclase predominates over sanidine, while in the specimens taken from its sides sanidine is more abundant. The former Möller calls tephrite, the latter phonolite. In the phonolite, corroded grains of hornblende are often surrounded by rims of augite. Associated with these rocks, but in smaller quantity, is a dark nepheline basanite containing corroded augite crystals surrounded by zones of the same mineral, with a similar optical orientation, but a little different composition. The main portion of the rock composing Ulmenstein is a nepheline basanite which, by the subordination of its feldspar, locally passes into limburgite. Some of the larger of the feldspar crystals in this rock show the hour-glass structure frequently seen in augite. The rock of Pietzelstein is a nepheline basalt. Very detailed analyses of specimens of all these rocks are given, and each is very minutely described.——According to Harker,[4] most of the dyke-rocks of the Island Anglesey, off the northwest coast of Wales, are diabases and augite porphyrites. One of these dykes cutting a calcareous shale has converted this rock into a lydianite, in which calcite, clusters of garnet, and anal-

[1] American Naturalist, 1885, p. 497.
[2] Copper-Bearing Rocks. Monog. V., U. S. Geol. Survey.
[3] Neues Jahrb. f. Minn., etc. 1888. I., p. 81.
[4] Geol. Magazine, 1887, Sept., p. 410, and Dec., p. 545.

cite crystals are developed. Other dykes from the northern portion of the island appear to consist of hornblende and biotite picrites. In one case newly formed, almost colorless hornblende is described as forming a cement between crystals of original hornblende, in a manner analogous to the quartz cement in indurated quartzites.

MINERALOGICAL NEWS.—The diamonds found in the Province of Minas Geraes, Brazil, are associated with the oxides of titanium, martite, monazite, and xenotine. They are usually found in quaternary alluvial deposits, but have their origin, according to Gorceix,[1] in the itacolumites and mica schists which are archæan. In these rocks they occur in deposits analogous to those of topaz, anatase, rutite, etc. All these minerals occupy well-defined bands in the itacolumite, and are original in it, and are not derived from some older rock, whose detritus supplied the material for the itacolumite and the mica schist. This explanation of the origin of Brazilian diamonds is quite different from that offered[2] in the case of diamonds of the African and American fields.——*Polianite*, the anhydrous manganese dioxide, has heretofore not been found in sufficiently well-crystallized specimens to admit of a satisfactory determination of its crystallographic constituents. The investigations[3] seemed to point to an orthorhombic symmetry for it. Messrs. Dana and Penfield[4] have recently proven it to be tetragonal and isomorphous with cassiterite, with $a:c=1:.66467$. The crystals examined are composite, being composed of several tetragonal individuals which produce a body with an orthorhombic habit. Their specific gravity is 4.992, and their composition as follows:—

MnO	O	Fe_2O_3	SiO_2	H_2O	Insoluble.
80.81	18.16	.16	.36	.28	.16,

revealing a very pure manganese dioxide.——In the basalt from the neighborhood of Périer (Puy de Dôme) are little veins of clayey material[5] in which are imbedded crystals of augite and lozenge-shaped flat plates of *feldspar*. The plates are sections parallel to the clinopinacoid, bounded by the planes oP and $P\bar{\infty}$ equally developed. They are frequently twinned with $\infty P\bar{\infty}$ as the composition face.——Jannetaz[6] has analyzed *uranite* from the Island of Madagascar, with this result:—

——Igelström[7] has discovered a manganese, rich and antimony-

P_2O_5	NO_2	Fe_2O_3	CaO	Loss (water).
14.93	55.08	1.365	6.51	22.08

[1] Comptes Rendus, cv., 1887, p. 1139.
[2] American Naturalist, 1887, p. 664.
[3] American Naturalist, March, 1888, p. 249.
[4] Amer. Jour. Sci., March 1888, p. 243.
[5] Lévy: Bull. d. l. Soc. Franç. d. Miner., X., 1887, p. 69.
[6] Ib., p. 47.
[7] Bull. Soc. Franç. d. Min., ix., 1887, p. 218.

bearing *berzellite*, associated with barite, tephroite, calcite, and hausmannite, in veins and nests in the vicinity of Sjögrufan, Grythyttan parish, Örebro, Sweden. The new mineral, to which the name *pyrrhoarsenite* has been given, has a color resembling that of crocoite. It has a hardness of 4, and is soluble in hydrochloric acid. It possesses the optical properties of berzellite, and a composition as follows:—

$As_2O_5+Sb_2O_5$	MnO	CaO	MgO	SiO_2	H_2O	$Al_2O_3+Fe_2O_3$
58.06	17.96	18.68	3.58	1.02	.85	traces.

which may be represented by the formula $(Ca,Mn.,Mg)_3(As, Sb)_2O_8$.

MISCELLANEOUS.—Cohen[1] has re-investigated the subject of the pleochroic halos (Höfe) in the biotites of granite and gneiss, and is thereby led to the conclusion that they are produced by the accumulation of organic substances in the neighborhood of the inclusions they surround, and are not due to the aggregation of mica molecules richer in iron than those forming the main portion of the mineral in which the halos occur. He finds, contrary to the experience of Lévy,[2] that the halos are not affected by treatment with hydrochloric acid, as they should be if they contain a large proportion of iron, but that they are destroyed by heating to a temperature considerably higher than that which is necessary to obliterate the halos in muscovite and cordierite, in which minerals this phenomena is now generally believed to be due in some way to an organic substance.——Franklinite, together with its natural associate, zincite, has been artificially produced by Gorgeu[3] by subjecting to a cherry-red heat an intimate mixture of one part of sodium sulphate, one-half part of zinc sulphate, a quarter to a half part of ferric sulphate, and a little manganese sulphate.[4]

BOTANY.[5]

THE COLLECTION AND STUDY OF CHARACEÆ. — Characeæ are neglected by botanists in general, who seem to have an aversion to all aquatic plants, mainly, it is presumed, from the fact that the collection of aquatics is a specialty. One must go prepared with dredge and rake, with paper and muslin, in order to gather successfully plants of this sort. It has come about that very few bits of Characeæ have been gathered here and there by expeditions and by

[1] Neues Jahrb. f. Min., etc. 1888. I., p. 165.
[2] Comptes Rendus, xciv., 1882, p. 1196.
[3] Bull. Soc. Franç. d. Min., x., 1887, p. 50.
[4] Cf. American Naturalist, 1887, p. 475.
[5] Edited by Prof. Chas. E. Bessey, Lincoln, Neb.